

REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Official Action of January 21, 2005, relating to the above-identified application.

A one-month extension of time, together with the associated fee, is filed herewith.

It is noted that the requirement for restriction between Claims 1-16 and Claims 17-36 has been made final. Notwithstanding the finality of the restriction requirement, applicants wish to have the following comments further considered.

In the Official Action of January 21, 2005, on page 2, it is said that the arguments previously submitted were not found persuasive "...because it is further shown that the apparatus as claimed can be used to practice another and materially different process." The *Fink, et al.* patent (US 4,153,501) is cited, as allegedly showing an apparatus that can be used for the practice of the present invention. However, it is believed that the allegation in the Official Action contradicts the actual teachings of the *Fink, et al.* patent. The reference teaches, in col. 8, lines 23-28, that the apparatus for carrying out the disclosed process comprises the essential feature that in the assembled state, the segments of the apparatus are coupled in such a way that their joints present no barrier to heat flow. This clearly conveys to a person skilled in the art that the partition walls separating the channels 3 in the apparatus disclosed in *Fink, et al.* are necessary features required to form heat connecting joints.

In contrast, the apparatus claimed in the present application does not have such joints between the wall elements. Rather, the wall elements of applicants' invention are separated by the slot-shaped reaction spaces across essentially the full area of the elements. Consequently, the subject matter defined in applicants' claims lacks a feature which is taught by *Fink* to be

necessary and essential for the apparatus to carry out the intended process. It is, therefore, respectfully requested that the requirement for restriction be again reconsidered and withdrawn.

Reconsideration is respectfully requested of the rejection of Claims 17-36 under 35 U.S.C. § 112 (second paragraph) as being allegedly indefinite. Claims 1 and 17 have been amended and Claim 34 has been cancelled. Also, Claims 6 and 22 have been cancelled since their features have been incorporated into Claims 1 and 17. These amendments to the claims are for purposes of clarification and are not intended to limit the scope of the claims.

Amending the claims to recite the tubular cavities and the spot-shaped reaction spaces makes it clear that the tubular cavities conduct the heat exchange medium through the wall elements.

The features added to Claims 1 and 17 are based on original Claims 6 and 22 respectively, as well as the disclosure in the application on page 7, lines 6-9, page 9, lines 20-23, and page 12, lines 19-20. It is, therefore, believed that the rejection of the claims under 35 U.S.C. § 112 has been overcome.

The rejection of Claims 17, 19, 20 and 22 as allegedly anticipated under 35 U.S.C. § 102(b) in view of *Schubert, et al.* (US 5,803,600) is traversed and reconsideration is respectfully requested.

In the Official Action, the disclosure of *Schubert*, at col. 3, lines 48-59, is relied on as allegedly disclosing an apparatus comprising a reactor in which there is located a plurality of wall elements, a plurality of slot-shaped reaction spaces, a plurality of cavities for conducting a fluid heat exchange medium, and where the reaction spaces are formed between the lateral surfaces of two abutting wall elements. The *Schubert* reference is also quoted to show wall

elements made of solid plates arranged interchangeably in a block as a virtual right parallelepiped wherein the slot-shaped reaction spaces are able to have reactants A and B supplied from the same side of the block and wherein the reaction spaces are oriented to guide the reaction mixture C through the reaction spaces in the same direction and in parallel flows. However, applicants submit that the description in col. 3 contains no disclosure whatsoever of the structure and geometry of the partial mixing chambers 12a. Accordingly, the allegation in the Official Action that the partial mixing chambers are slot shaped can be based only on Figure 3b of the reference. It seems that the Official Action has not acknowledged a feature of the partial mixing chambers 12a shown in Figure 3b and, therefore, incorrectly ascribes the wrong geometry of these chambers from the drawings. Figures 3a and 3b are schematic drawings of the device as disclosed in *Schubert* and the device 6 in Figure 3a is a schematic representation of the flow guide structure shown in detail in Figures 1a to 1d.

The foils 1 and 2 comprising parallel grooves 3 and 4 are represented in Figure 3a by two horizontal parallel solid lines and a third dashed line parallel to and closely above the bottom solid line, thereby depicting the groove bottoms 4b and 5b.

In Figure 3b, the elements of the guide search 13 between the distance foils 14 are depicted in the same manner and the Official Action has correctly identified them on page 4 of the Official Action as having the same structure of foils with grooves as their counterparts in Figure 3a.

It appears that the Official Action has not acknowledged that the dashed lines shown near the bottom of elements 12a in Figure 3b clearly indicate that these elements must have the same structure of foils with grooves as the similarly depicted elements 13a and 13b; the only

difference being having twice the foil thickness. Accordingly, the allegations in the Official Action that features 12a of Figure 3b are slot-shaped spaces between foil elements 12b is in clear contradiction to the disclosure of Figure 3b of the reference. There is no basis in the description for the conclusion set forth in the Official Action.

Moreover, *Schubert* does not disclose a device wherein wall elements are arranged interchangeably. Thus, there is no indication in the reference that the foils of the disclosed device may be interchanged and the only disclosure on how the foils are joined in col. 3, lines 9-13, refers to diffusion welding which inevitably leads to a device where the foils cannot be interchanged.

Consequently, applicants respectfully submit that *Schubert* cannot anticipate the claimed apparatus.

The rejection of Claims 17, 23-25 and 33 as anticipated under 35 U.S.C. § 102(b) in view of *Haselden* (US 3,528,783) is traversed and reconsideration is respectfully requested.

The Official Action refers to the reference as showing an apparatus in which a reactor has a plurality of wall elements which are considered to be heat transfer panels, a plurality of slot-shaped reaction spaces and a plurality of cavities for conducting a fluid heat exchange medium. However, applicants' respectfully submit that the reference, in col. 1, lines 14-35, in Claims 1-11, only refer to plates that separate chambers containing catalysts from chambers constituting channels for flow of heat transfer medium. Therefore, the term "plates" used in the Abstract and claims of *Haselden* clearly refers to the flat metal plates 13 shown in Figure 1 and not to the panels 11. Moreover, there is no indication in the reference that the plates or the metal plates 13

disclosed in the reference comprise any tubular cavities for conducting a fluid heat exchange medium.

The Official Action relies on col. 3, lines 7-38, and Figure 1 of the *Haselden* reference and considers that the panel 11 corresponds to the claimed feature of this invention of the wall elements made of solid plates having tubular cavities.

Applicants would point out that there is no disclosure in *Haselden* as far as the thickness of the catalyst layer 16 between the plates 13 of two panels 11 shown in Figure 1. Moreover, *Haselden* gives no indication that the distance between plates 13 of the two panels 11 may have any effect on the spreading of flames in the slot formed between two panels. Accordingly, applicants respectfully submit that the subject matter of the amended claims is not anticipated by *Haselden*.

The rejection of Claims 17, 23 and 33 as anticipated under 35 U.S.C. § 102(b) in view of *Vu, et al.* (US 4,820,495) is traversed and reconsideration is respectfully requested.

Vu is summarized in the Official Action as showing a reactor in which there are located a plurality of wall elements, a plurality of slot-shaped reaction spaces and a plurality of cavities for conducting therethrough a heat exchange medium. The slot-shaped reaction spaces are said to be able to have the reaction supplied from the same side of the block and being oriented to guide the reaction mixture through the reaction spaces in the same direction and in parallel flows.

In response, applicants would point out that the reference contains no disclosure as far as the distance is concerned between the heat exchange plates 9 or 31 and provides no guidance to a person skilled in the art on how to selected such distances. The reference also does not give any indication that the distance between the plates 9 or 31 may have any effect on the spreading of

flames in the slot formed between the two plates. Accordingly, applicants respectfully submit that the subject matter of the amended claims is novel and not rendered unpatentable in view of the reference.

The rejection of Claims 17-20, 22-30 and 36 as allegedly obvious under 35 U.S.C. § 103(a) in view of *Ashmead, et al.* (US 5,690,763) is traversed and reconsideration is respectfully requested. The Office Action summarizes the *Ashmead* reference and then admits that the reference is silent as to the right parallelepiped wall elements and tubular shaped heat exchanger cavities. Nevertheless, the Office Action concludes that it would have been obvious to a person having ordinary skill in the art to “select such geometries for the wall elements and heat exchanger cavities in the apparatus of *Ashmead, et al.* on the basis of stability of the intended use, because changes in shape would merely involve ordinary skill in the art”.

In response, applicants note that the Official Action does not appear to have considered the relationships between the features of the claimed apparatus when assessing the differences between the claimed apparatus and the devices disclosed by *Ashmead*. Thus, the slot-shaped reaction space formed between lateral surfaces of two abutting and substantially right parallelepipedal wall elements will necessarily be planar with a substantially constant width and extend across essentially the whole area of the wall element surface because the lateral surface of the right parallelepipedal element is by definition substantially flat.

In the device shown by *Ashmead*, the laminae 1000 to 1100 are in direct contact with each other thereby leaving no space between the lateral surfaces of the laminae except for the portions of the surfaces that have been deepened by grooves or other recesses. This direct contact between laminae is necessary for the device to be operable by conducting reactants and

products to and from laminae through ports 20, 24 and 34 of the device. The reactor channels 90-1' to 90-8' cited by the Examiner are fundamentally different from the slot-shaped reaction spaces of the application in that the lateral surfaces of laminae 1000 and 1100 shown in Figure 16 of the reference are in direct contact with each other. This leaves no space in between except for the recesses formed by the grooves in the surface of laminae 1000 and 1100. Consequently, the reactor channels 90-1' to 90-8' are confined to the areas of such recesses whereas the reaction space of the claimed invention extends across the full area of the lateral surfaces forming the reaction space.

The heat exchanger assembly as shown in Figures 10, 13 and 14 of *Ashmead, et al.* cited in the Official Action do not comprise wall elements with tubular cavities for conducting a fluid exchange medium reaching through a wall element. In the assembly of Figure 10, the heat exchanging fluid enters through the inlet port 75 and leaves through outlet port 76. This is described in col. 12, lines 3-5, of the reference. The fluid is not passed through any tubular cavity reaching through the wall elements 500 or 600. All the cavities reaching through the wall elements are necessary for passing through reactants or reaction products and the device would not fulfill the intended purpose if heat-exchanging fluid would be passed through one of these cavities. The same holds for the cavities of the wall elements 800, 900 and 1000, which form the heat exchanger assemblies of Figures 13 and 14.

It is noted that the Official Action that a person of ordinary skill in the art would consider the geometry of the reaction spaces formed in the claimed apparatus as being suitable for the intended use of the apparatus of *Ashmead*. Applicants respectfully submit that this allegation is in clear contradiction to the teachings of the reference. Indeed, *Ashmead* explicitly

teaches that the apparatus requires a tortuous channel for passing the reactants through to fulfill its purpose. It is noted that the Examiner has cited that teaching in the Official Action.

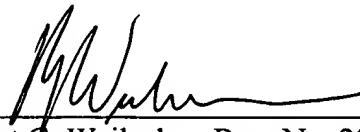
However, a skilled person would not consider the flat reaction spaces of uniform distance formed between wall elements of the claimed apparatus to be tortuous channels and, therefore, would not consider to use such a geometry for reaction spaces based on the teaching of *Ashmead, et al.*

Applicants further wish to comment that the claimed apparatus would not be obvious over *Schubert, et al.* The apparatus disclosed in *Schubert* is assembled from foils with grooves cut into the surface of such foils. A skilled person in the art with the knowledge of the apparatus of Figure 3b would only arrive at an apparatus as claimed in the application if he would replace the foils 12b with grooves cut into the surface by foils having tubular cavities inside the foil and at the same time, omitting the foils 12a. However, *Schubert, et al.* gives not indication of how to make a foil 100 μm thick having tubular cavities inside the foil and the use of such foils is not common practice for the person skilled in this technology. Instead, a skilled person in this art would not consider to omit the foils 12a and arrange foils 12b with no support above and below because he would not expect such an arrangement to be pressure tight as required by the teachings of *Schubert*. Therefore, the claimed apparatus in this case is not an obvious variation in view of the apparatus of *Schubert, et al.* and none of the cited documents suggest the modification to arrive at the claimed subject matter.

In view of the foregoing, applicants respectfully request reconsideration and favorable action at the Examiner's earliest convenience.

Respectfully submitted,

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